Public Abstract
First Name:Curtis
Middle Name:John
Last Name:Pritzl
Adviser's First Name:Daniel
Adviser's Last Name:Hassett
Co-Adviser's First Name:
Co-Adviser's Last Name:
Graduation Term:SP 2011
Department:Microbiology- Medicine
Degree:PhD
Title:Studies on the Development of a Bacillus Endospore-Based Microparticle Vaccine Platform

The rapid and safe immunization of populations is critical in response to emerging infectious diseases or biological attacks. Currently, many subunit vaccines are insufficiently immunogenic to protect against pathogen invasion, therefore novel adjuvants are required. This dissertation describes the development of a novel antigen display system the utilizes bacterial antigens displayed on the surface of Bacillus endospores. Initial immunogenicity studies were performed utilizing the model antigen beta-galactosidase. This study demonstrates that UV-irradiated B. thuringiensis spores elicit potent innate immune responses from murine, bone marrow-derived dendritic cells. Finally, the protective capacity of this vaccine platform was investigated using a dominant antigen of Yersinia pestis. The protein was displayed on the surface of biotinylated Bacillus thuringiensis spores. Mice immunized with this vaccine rapidly developed high-titer antibodies and were protected from a lethal intranasal plague challenge. These data imply that the spore-displayed antigen system is a potent delivery system that is suitable for parenteral or mucosal immunizations against emerging infectious diseases and potential biological weapons.